

DETAILED ACTION

1. Claims 1-10 are pending in this application.

Priority

2. Receipt is acknowledged of papers submitted under 35 U.S.C. 119(a)-(d), which papers have been placed of record in the file.

Information Disclosure Statement

3. The information disclosure statement (IDS) submitted on 5/31/07 is in compliance with the provisions of 37 CFR 1.97. Accordingly, the information disclosure statement is being considered by the examiner.

Drawings

4. Figures 2 and 3A should be designated by a legend such as --Prior Art-- because only that which is old is illustrated. See MPEP § 608.02(g). Corrected drawings in compliance with 37 CFR 1.121(d) are required in reply to the Office action to avoid abandonment of the application. The replacement sheet(s) should be labeled "Replacement Sheet" in the page header (as per 37 CFR 1.84(c)) so as not to obstruct any portion of the drawing figures. If the changes are not accepted by the examiner, the applicant will be notified and informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance.

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5. Note that figures 2 and 3A have been disclosed as “conventional drawings in paragraphs [0016], [0017] and [0041]; therefore, figures 2 and 3A should be labeled as prior arts.

6. The drawings are objected to under 37 CFR 1.83(a). The drawings must show every feature of the invention specified in the claims. Therefore, the claimed “low pass filtering” in claim 1, “null filter” in claim 5, “means for high filtering” in claim 7, “decoding device” in claim 9 must be shown or the feature(s) canceled from the claim(s). No new matter should be entered.

Corrected drawing sheets in compliance with 37 CFR 1.121(d) are required in reply to the Office action to avoid abandonment of the application. Any amended replacement drawing sheet should include all of the figures appearing on the immediate prior version of the sheet, even if only one figure is being amended. The figure or figure number of an amended drawing should not be labeled as “amended.” If a drawing figure is to be canceled, the appropriate figure must be removed from the replacement sheet, and where necessary, the remaining figures must be renumbered and appropriate changes made to the brief description of the several views of the drawings for consistency. Additional replacement sheets may be necessary to show the renumbering of the remaining figures. Each drawing sheet submitted after the filing date of an application must be labeled in the top margin as either “Replacement Sheet” or “New Sheet” pursuant to 37 CFR 1.121(d). If the changes are not accepted by the examiner, the applicant will be notified and informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance.

Specification

7. The abstract of the disclosure does not commence on a separate sheet in accordance with 37 CFR 1.52(b)(4). A new abstract of the disclosure is required and must be presented on a separate sheet, apart from any other text.
8. The abstract of the disclosure is objected to because the term “said” used in the abstract reads as a claim rather than an abstract of the disclosure. Correction is required. See MPEP § 608.01(b).

Claim Rejections - 35 USC § 112

9. The following is a quotation of the first paragraph of 35 U.S.C. 112:

The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

10. Claims 2,3 and 4 are rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the enablement requirement. The claim(s) contains subject matter which was not described in the specification in such a way as to enable one skilled in the art to which it pertains, or with which it is most nearly connected, to make and/or use the invention.

It is not clear from the claim or from the disclosure how the “high-pass filter that is used for the construction step is driven from the low-pass filter used for the inverse wavelet transformation.” Is the claimed low-pass filter the same as LPv shown in the

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two-dimensional Inverse Wavelet Transform shown in figure 2? What is driven from the low-pass filter to be used by the high-pass filter?

The claimed “normalization factor” has been claimed as being **before the constructing step**, however, as figure 3B best describes the claimed “normalization factor (see K_e and K_o in figure 3B) in claim 3, it is not clear from the disclosure how it is applied to the original low-low spatial frequency (LL) **before it is constructed to** HI, LH and HH. The above analysis is made based on the fact that the normalization is done before the claimed and disclosed high-pass filtering.

The claimed constructing the “high frequency subbands comprises a sub-step of shifting, sub-step of predicting and sub-step of computing high-frequency” is best described by figure 3B, however it is not clear from the disclosure or the claimed whether figure 3B is the high pass filter claimed in claim 1 which constructs the high frequency sub-bands.

11. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

12. Claim 4 is rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

The claimed “high frequency subbands” in claim 4 lacks a clear antecedent base.

Claim Rejections - 35 USC § 102

13. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

14. Claims 1 and 6-10 are rejected under 35 U.S.C. 102(b) as being anticipated by Creusere (US patent number 6,466,698).

Creusere teaches a method for spatial up-scaling of an original video frame comprising p rows and q columns of pixels, where p and q are integers, said up-scaling method comprising the steps of:

high-pass filtering the original video frame, considered as a low-low spatial frequency subband (LL), in horizontal, vertical, and both directions, to construct high-low (HL), low-high (LH), and high-high (HH) virtual spatial frequency subbands comprising p rows and q columns of pixels, respectively (see figure 3),

applying an inverse wavelet transform (IWT) to the constructed subbands and to the original video frame so that an up-sampled version of the original image is obtained as in claim 1 (see figure 1).

Further to claim 6, Creusere teaches the construction step and the inverse wavelet transform step are iterated until a predetermined up-scaling factor is reached.

Further to claim 7 Creusere also teaches that the device for spatial up-scaling of an original video frame comprising p rows and q columns of pixels, where p and q are integers, said up-scaling device comprising:

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means for high-pass filtering the original video frame, considered as a low-low spatial frequency subband (LL), in horizontal, vertical, and both directions, in order to construct high-low (HL), low-high (LH), and high-high (HH) spatial frequency subbands comprising p rows and q columns of pixels, respectively (see figure 10),

means for performing an inverse wavelet transform (IWT) on the constructed subbands and on the original video frame so that an up-sampled version of the original image is obtained (see figure 1 and 10).

Further to claim 8 Creusere teaches an apparatus for displaying video frames, said apparatus comprising an up- scaling device as claimed in claim 7, which is adapted to provide an up-scaled video frame from an input video frame received by said apparatus (see output image which is up-scaled version of the input image in figure 10).

Further to claim 9 Creusere teaches A video decoding device for producing an output stream comprising decoded video frames (see decoder in figure 10b) from an input stream comprising encoded video frames (see encoded input video in figure 10a), said decoding device comprising an up-scaling device as claimed in claim 7, which is adapted to provide an up-scaled video frame from a decoded video frame (see output image in figure 10b, which up-scaled of the input image in figure 10a).

Further to claim 10 a computer program product comprising program instructions for implementing, when said program is executed by a processor (see col. 1, lines 15-20 and software programs disclosed in col. 7, 9, and 11-18).

Conclusion

15. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. US patent numbers 6,389,176, 6,813,384 and 7,085,436 issued to Hsu et al., Acharya et al. and Akhan et al. respectively disclose an up-scaling of a video from comprising a discrete wavelet transformation and an inverse discrete wavelet transformation..

16. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Tesfaldet Bocure whose telephone number is (571) 272-3015. The examiner can normally be reached on Mon-Thur (8:00a-5:30p) & Mon.-Fri (8:00a-5:30p).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Mohammed H. Ghayour can be reached on (571) 272-3021. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

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